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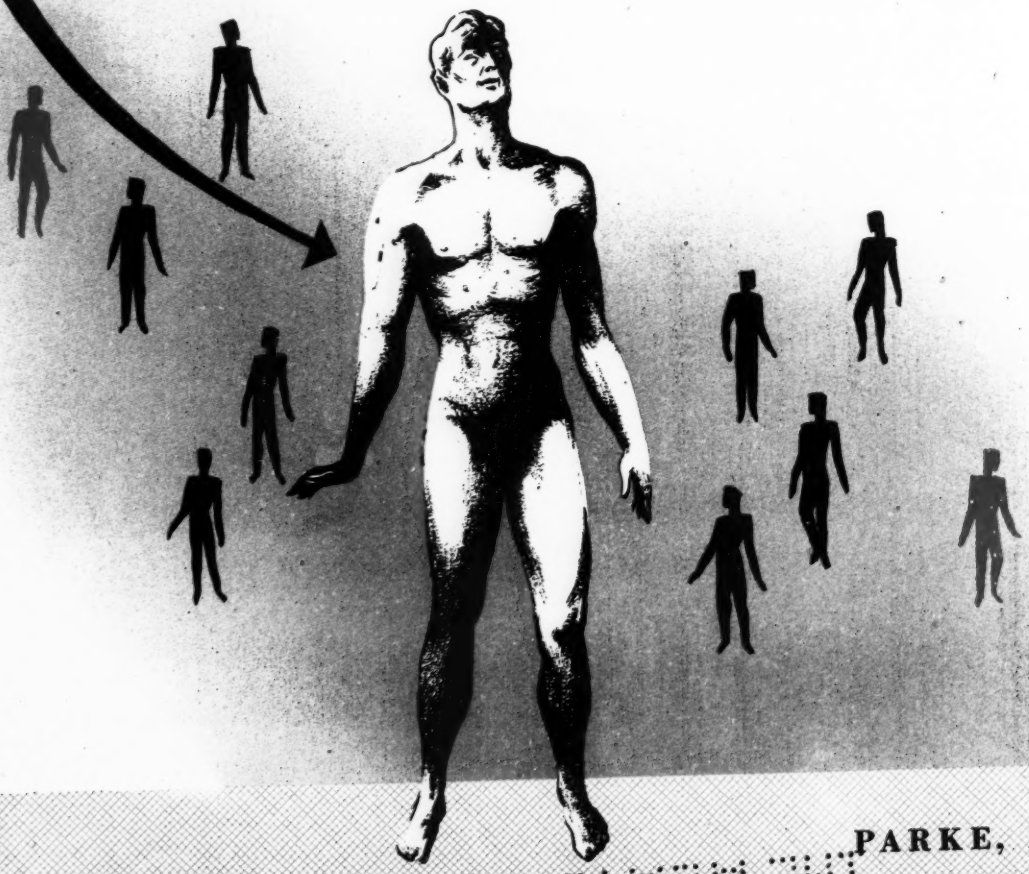

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BLOOD TRANSFUSIONS AND TRANSFUSION REACTIONS

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Over fifteen hundred annual blood transfusions at the Delaware Hospital represents the universal trend that has firmly established this form of therapy.

The increasing use of transfusion therapy is due to several factors, (1) ready availability of blood from the modern Blood Bank (2) ease of administration with the newer equipment and, (3) knowledge of the value of blood in various conditions.

INDICATIONS FOR TRANSFUSIONS

Some doubt may be expressed regarding the actual necessity for the use of the very large number of transfusions which are being administered. Their use varies with the hospital and the individual physician. In many hospitals the major surgical operation has become the most common indication for the use of transfusion therapy. This is true in the Delaware Hospital. The use of one or more transfusions before serious operations, particularly if any degree of anemia is present has become almost routine. During operation, the constant infusion of blood into the patient's veins is at once a reassuring sight to the surgeon and doubtless a mainstay to the patient's circulation. Our files indicate that transfusions are being used in the following conditions:

(1) Major surgical operative procedures—before, during, and after operation.

(2) Following severe hemmorhage.

(3) In conditions of shock from hemorrhage, trauma, burns or infections.

(4) In severe anemia of diverse origins.

(5) In miscellaneous hematologic problems, including agranulocytosis, leukemia, thrombocytopenic purpura and other hemorrhagic diseases.

(6) In conditions of hypoproteinemia.

(7) In such conditions as prolonged convalescence, delayed wound healing and chronic infections.

During operation, the use of transfusion has become a standard procedure and may well contribute to the diminishing incidence of vascular collapse. A note of caution however, should be sounded as the anesthetized patient may show no indications of a severe transfusion reaction, only to discover the result at a later hour.

Following operation, fluids of various types including blood are sometimes freely poured into the patient. This may well be overdone, particularly in the older age groups, since the pulmonary circuit must be the first to bear the brunt of a sudden increase in blood volume, with the result that pulmonary edema may develop.

In severe anemias of diverse origin: aplastic, hemolytic, leukemic, etc., transfusions are often essential either as a temporary measure while awaiting some other procedure such as splenectomy or as the only therapeutic measure of any value. In other hematologic problems similar benefit is obtained. In agranulocytosis, to stimulate the number of leukocytes and improve the defensive mechanisms; in thrombocytopenic purpura, to correct deficiences in the blood while awaiting possible splenectomy; in hemophilia to add a normal plasma factor and thus control hemorrhage. Transfusions of red blood cell suspensions have been proven beneficial, particularly in refractory cases of anemia, where there is adequate plasma protein. Several cases of sickle cell anemia have been maintained on red cell transfusions prepared from Bank Blood outdated for routine use. Red cells derived from Blood and Plasma banking programs may even be given in double or triple concentrations.

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DANGERS OF TRANSFUSION

The subject of transfusion therapy would hardly require discussion at this time were it not for the fact that the administration of blood is not without its danger. This may be either circulatory or associated with various types of reactions which may occur within the blood stream.

The quick introduction into a vein of a pint or more of blood results in distention of the right auricle and in a sudden rise of intravascular pressure. Considerable increase may occur in the venous pressure, the cardiac output and perhaps in the velocity of blood flow. If blood is given at a rate greater than 20 c.c. per minute, a speed reaction may develop. The rapid introduction of quantities of blood larger than 500 c.c. may result in more or less marked pulmonary edema. This is particularly true in the anemic elderly individual, who not only has a rigid type of vascular apparatus but a more or less weakened myocardium. Cough, dyspnea, wheezing, orthopnea, and, in extreme cases, all the symptoms of pulmonary edema may result. Even relatively minor reactions may be productive of profound circulatory abnormalities, with the sudden precipitation of heart failure or coronary occlusion[1]. For this reason, transfusions in the elderly subject must be administered with unusual caution and the blood be given at no greater a rate than 2 c.c. per minute (4 hours for 500 c.c.). The amount administered to children must also be carefully controlled, remembering that 100 c.c. administered to a 10 pound child is equivalent of 1500 c.c. to an average man.

The most common of the dangers involved in transfusion have to do with various types of non-circulatory reactions. Significant but not serious reactions occur in from 5-10% of all transfusions[1]. Minor reactions occur commonly and include such subjective complaints as headache and malaise, slight chilly sensations, and the appearance of an urticarial eruption. Many unexplained reactions with or without urticaria may be on an allergic basis but proof of such a relationship is difficult to confirm.

A majority of reactions consist of chills and fever, at times very marked. This type of reaction usually appears towards the end of the transfusion, or shortly after its completion, the patient complains of cold and then begins to shake violently. After varying lengths of time, the shaking chill subsides and a sharp elevation in temperature may occur. The urine shows no change in color and there is a complete lack of hemoglobin by the benzidine test. The blood shows no demonstrable increase of plasma hemoglobin. These reactions are probably pyrogenic for the most part, and though disconcerting, they can hardly be classed as serious except in the occasional debilitated elderly person with an impaired myocardium and chronic anemia. They are usually due to the presence of foreign material in the needle, tubing, solutions or rarely in the blood itself.

The most serious type of transfusion reaction results from intravascular hemagglutination due to the interaction of an agglutinin in the patient's plasma with an agglutinogen in the donor's red cells. Rarely an error in blood grouping or cross-matching results in the administration of incompatible blood. More commonly errors may occur when the cross-matching has been omitted, or when a bottle of blood has been mislabeled, or the identifying label is not read or is incorrectly interpreted. Occasionally donors have weak agglutinogen and are mistyped and cross-matched. This can easily occur with weak non-avid typing sera, or old contaminated sera. The most common and hardest to prevent are those dealing with the Rh factor. Too many incompatible reactions are the result of hurry. If time does not permit an adequate compatibility check, then low titre or neutralized 0 blood should be used.

Damshek writing on Blood Transfusion and Reaction[1] states that: "The agglutination reaction which takes place within the circulation proceeds approximately as follows:

"(1) The red cells agglutinate in large masses within various parts of the circulation, including the glomeruli of the kidneys.

"(2) Intravascular agglutination leads to intravascular hemolysis due to the mechanical trauma of the constantly pulsating circulation upon the agglutinated red cells; these have an increased mechanical fragility. Intravascular hemolysis leads to hemoglobinemia and to hemoglobinuria.

"(3) In the acid reacting renal tubules the hemoglobin from the hemolyzed red cells becomes modified to colloidal acid hematin. The renal tubules become plugged with insoluble acid hematin casts leading to a tubular nephrosis. This may terminate in all the various evidences of renal shut down with uremia and death.

"(4) The initial intravascular hemolysis gives way to a more orderly type of hemolysis with bilirubinemia, jaundice, an increased output of urobilinogen in the urine, etc.

"Clinically during the administration of the first 50 to 100 c.c. of incompatible blood, the patient usually complains of a vague sense of malaise, a sense of constriction in the chest, a feeling of suffocation, pain in the flanks, and then in the thighs. Dyspnea may become agonizing and the pain so severe as to result in loud cries. The teeth begin to chatter, and the patient then has a violent chill. Cyanosis and vascular collapse may develop. The first urine passed may be clear and normal in color (bladder urine) but later urine specimens, due to their contained hemoglobin, are mahogany-brown or burgundy-red in color.

"The urine output soon becomes sharply reduced. Within 24 hours, often only from 5 to 20 c.c. of murky urine are being passed, containing large amounts of hemoglobin, albumin and casts. In another day or two, the puffiness of acute nephrosis becomes evident, and in a few days, the full-blown symptoms of uremia are in evidence. Finally, the patient either lapses into coma and dies, or suddenly begins to pass urine and recovers."

After kidney shutdown takes place and edema begins the blood pressure generally rises, the nonprotein nitrogen steadily rises, acidosis becomes detectable and when death occurs it is usually due either to pulmonary edema or potassium intoxication.

Histologically within the first 18 to 24 hours there is fatty change in the ascending limbs of Henle's loops [4]. Within 37 to 72 hours there are pigment deposits found in the distal convoluted and collecting tubules, there is, however, no actual plugging of the renal tubules by blood pigments. Slight dilatation of the tubules may follow. On the third to the fifth day necrosis and regeneration of the affected tubules becomes apparent together with the infiltration of the surrounding tissue and blood vessels with round cells. After the fifth day many tubules can be seen to be ruptured. There is no evidence of any glomerular damage. The entire kidney becomes edematous and the glomerular capsules become filled with amorphous debris. Once re-epithelization of the renal tubules begins it may be complete within two weeks and the kidney will reveal no residual effects.

Lucke[2] has determined the survival time in 100 fatal cases of lower nephron nephrosis. 95% of cases were dead within 14 days. 86% died within 10 days, and 48% were dead after 6 days. It is very unlikely that the 48% that died in 6 days could have died of renal insufficiency alone for the time elapsed was too brief.

TREATMENT FOR RENAL FAILURE

At this point let us consider the essentials of treatment of renal failure. A 150 pound man who has developed complete renal shutdown will lose approximately 1000 c.c. of water by evaporation and respiration. In the absence of marked sweating no appreciable amount of electrolyte will be lost. Gastric intolerance for food soon develops and oral treatment must be stopped. About 70 grams of body protein will be utilized daily and the remaining caloric requirement will be supplied by utilizing approximately 200 grams of body fat. In the presence of this metabolism nitrogenous wastes will accumulate in the body; potassium, sulfate and phosphate concentrations will also gradually increase. The body will produce approximately 470 c.c. of water from oxidation and metabolism, leaving a daily deficit of 530 c.c. The nitrogenous waste products will be distributed thru-out the 50 liters of body fluid and will rise in concentration steadily along with the blood potassium. The daily negative water balance will increase the osmotic pressure of the extracellular fluids and lead to cellular dehydration. The duration of life under these conditions is uncertain. It is likely that the rise in blood potassium will lead to fatal cardiac changes before nitrogen retention or acidosis become threatening to life.

If physiological saline solution is given to replace the fluid deficit the concentration of extracellular salts will increase with the sec-

ondary cellular dehydration since the fluid lost by evaporation is essentially salt free. If, however, sufficient distilled water is given to replace the water loss, the concentration of the electrolytes in the body fluids will be kept relatively constant. If in addition 100 grams of glucose is given daily in the distilled water, ketosis will be prevented and protein breakdown will be reduced by nearly one half as demonstrated by Butler and his associates[3]. This means that the nitrogenous waste products will accumulate at only one half of the rate they would if no glucose were given.

Strauss from the Cushing Veterans Administration Hospital [4] reports the following plan of treatment; "When it is observed that the urine volume is markedly diminished or anuria has occurred, 750 c.c. of 15% glucose in distilled water is given by vein daily, care being taken to run this in slowly, with every precaution to avoid thrombosis of veins. If necessary a vein is cut down upon. Nothing is given by mouth since vomiting appears to be increased by the oral administration of food or liquid. If there is significant vomiting the amount is carefully measured and that much physiologic saline solution is added to the daily infusion of dextrose in water. During the second week of treatment great fortitude is required because of the insistent demands that the patient be drowned with large volumes of intravenous fluids. This must be resisted.. If acidosis becomes clinically manifest a liter of one-sixth molar sodium lactate is given, the extracellular fluid volume being thus expanded as the price for combating acidosis. Electrocardiograms are made at least every other day for the observance of changes indicative of an excess of potassium. It is hoped at present that it may be possible to combat this by the insertion of a modified Miller-Abbott tube into the small intestine and perfusing a slightly hypertonic, potassium-free electrolyte into the proximal jejunum and withdrawing the solution, which is then in equilibrium with potassium from the distal ileum. Any loss of sodium is then replaced intravenously with either potassium-free Ringer lactate or one-sixth molar sodium lactate solution.

When the stage of diuresis appears in the second or third week of treatment a volume of water sufficient to make up for the total urine volume in addition to 1000 c.c. for insensible loss is given daily. Frequently, during the phase of diuresis, moderate to severe anemia may be noted. This is treated by a transfusion of fully matched blood. In the state of diuresis the kidney is producing only slightly modified glomerular filtrate as urine, which may show only a twofold or threefold concentration of nitrogen and a very little ability to conserve sodium chloride. Accordingly, salt depletion must be avoided, furthermore, at this time when the urine volume may be well in excess of two or three liters daily, the danger of drowning the patient has become remote."

TRANSFUSION SERVICE REPORT

From April 1947 through August 1948 a total of 1,919 transfusions of whole blood have been administered at the Delaware Hospital. Of this number 1,487 were given by a trained team of nurses working out of the Blood Bank. The other transfusions were administered by the house staff and department of anesthesia. All transfusions are followed up by the blood bank nurses in order to ascertain the condition of the recipient one, two, four and twenty-four hours after transfusion. In this manner a reasonable accurate check on the transfusion is made. It has been found that to rely on reports from busy nurses and house staff that many reactions are not recorded. A personal contact with the patient and a review of the temperature record is always necessary to fully evaluate a case. Following this program a total of 79 reactions of all types were uncovered in this period representing a reaction rate of 4%.

It is not possible to accurately compare reaction rates among different centers, as the method of compilation is always somewhat different. Jefferson Hospital, Philadelphia[5] reports a rate of approximately 4%, the Mayo Clinic reporting on well-followed cases during the first six months of 1947 lists 5.1%. Each month the reactions of the month are reviewed by our laboratory and blood bank staff and then graded. Doubtful cases are generally considered as a reaction. Four grades of reactions are classified. GRADE I type of reaction is one of an allergic type chiefly manifested by urticaria; GRADE II reactions include cases with a temperature rise of 2° in

known cases of sepsis or of 1° in afebrile conditions. A shaking chill is listed as a GRADE III reaction. GRADE IV reactions are of the hemolytic type in which the patient may exhibit any combination of the following symptoms: restlessness or anxiety, precordial fullness or pain, fullness in the head, generalized painful tingling, dyspnea or cough, tachycardia, flushing of face, signs of shock, dilated pupils, and most important, back pain, followed frequently by hemoglobinuria and subsequently by anuria.

Of the 79 transfusion reactions Table 1 lists them according to Grade.

TABLE 1

Grade	I	12
Grade	II	22
Grade	III	42
Grade	IV	3

Of the three Grade IV reactions, two were cases in which Rh positive blood was administered to Rh negative recipients. One a case of mistyping illustrates the importance of using avid standardized typing serum by personnel well trained and versed in the difficulties associated with the running of Rh typing. Even the best of technicians who are forced to hurry this precise procedure are potentially subject to error. The second Rh incompatibility resulted when in the absence of available Rh negative blood, the attending physician impressed by the urgent need for blood, elected to use Rh positive blood. By the routine saline cross matching then in use, the bloods appeared compatible. Subsequently after the transfusion when the case was being re-studied a cross matching using cells suspended in serum definitely indicated an incompatibility. This experience has prompted us to routinely use cells suspended in serum on all our cross matchings. The third case occurred as a result of a mislabeled bottle which was fortunately discovered by an alert house officer after the administration of only 10-20 c.c. of blood had resulted in severe back pain.

Table 2 enumerates the reactions in relation to the underlying disease.

TABLE 2

Gynecological	31
Anemia	13
Infection	7
Ulcer	7
Malignancy	6
Leukemia	5
Miscellaneous	10

The higher incidence in association with gynecological cases and with conditions primarily or secondarily resulting in severe anemia is noteworthy. In an attempt to reduce the number of reactions associated with these conditions, it was found advantageous, particularly in severe anemia to administer 250 c.c. transfusions rather than the usual 500 c.c. We have found that use of the larger amount has frequently resulted in over loading the circulation and produced an apparent reaction.

Table 3 lists the reactions according to the type of blood cross matched and suggests that the types of blood used had little effect on our reaction percentage.

TABLE 3

Type O to O	45
Type A to A	27
Type B to B	2
Type O to other	5

The low incidence of reactions with Type 0 used for other types is of interest as most blood banks are tending to use more Type 0 blood which has been neutralized with Group Specific A and B substance or low titre without cross matching. The low incidence of reaction with bloods of this type are further demonstrated in Table 4 which lists the number of reactions in the series of 79 in which low titre or neutralized blood was administered.

TABLE 4

Total # Neutralized Bloods Administered	310
Reactions with Neutralized Rh Specific Blood	3
Reactions with Low Titre Rh Specific	7

The importance of having blood available for use in an emergency at a moment's notice without the delay necessitated by cross matching is an obvious advantage to all. Routine use of any Type 0 blood is associated with some danger because of the occasional one containing large amounts of specific iso-agglutinins. To eliminate this possibility we have been titering the amount of antibody present, eliminating all of those showing agglutination with a serum dilution of 1/200 or more. When time has not permitted this procedure the antibody activity has been neutralized by the addition of 10 c.c. of Group Specific A and B substances to each 500 c.c. of blood.

DISCUSSION AND SUMMARY

A careful survey of our blood transfusion reactions has suggested the following:

When reactions occur, that there be close co-ordination between the Laboratory, Blood Bank and House Staff in establishing the nature of the reaction and the course of treatment.

That hemolytic reactions should be treated by conserving fluids, using distilled water instead of saline and preventing pulmonary edema. Ketosis will be reduced by using glucose in distilled water.

That the indication for a transfusion be carefully considered before requesting such therapy.

That blood be administered carefully to avoid speed reactions.

That over-transfusion be avoided especially in severe anemias as well as in children, arthritics and cardiac cases.

To selectively use anti-histaminics in cases of allergic reactions.

To sedate the apprehensive patient slightly before transfusion to allay fear which appears to increase the likelihood of minor reactions.

To use avid standardized typing serums.

To insist on experienced personnel handling typing and cross matching without being rushed.

To have all typing and cross matching run with cells suspended in serum instead of saline.

That when emergency transfusions are indicated to use Type 0 blood with a serum antibody titre less than 1/200 or to use neutralized Type 0 blood.

To remove blood from the refrigerator for at least one hour before administration.

To have two people, whenever possible, check blood cross matchings to avoid as far as possible the human element of error.

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NEEDLE BIOPSY OF THE LIVER: A PRELIMINARY REPORT

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Jaundice and hepatomegaly remain difficult diagnostic problems despite the increasing number of liver "function" tests at our command[1]. Surgical pathology has added but little to our understanding of the natural course of various liver diseases.

Needle biopsy of the liver is not a new procedure. Hoffbauer et al.,[2] in a brief review of the history of this method, state that it was first used by Lucatello in the last century. Several reports appeared following this in which fine-bore needles were used. However, because of the scantiness of the material obtained, the procedure did not achieve wide usage. Biopsy of the liver as an aid in the diagnosis of diseases of the liver remained in obscurity until 1939 when Iverson and Roholm[3] revived the procedure using large-bore needles to obtain their specimens. Reports from other investigators followed quickly [4], [5], [6]. Several techniques using various kinds of needles have been described. The majority of the reports on liver biopsy have come from the larger hospitals or from workers having access to large numbers of patients with liver disease.[7-13]

The present communication is a preliminary report of our experiences with needle

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biopsy of the liver in a general hospital. *Technique*: We have used the Franseen adaptation of the Iverson-Roholm needle exclusively. When the liver is palpable, the anterior abdominal approach, entering the liver in the mid-clavicular line just below the right costal margin, is used. When the liver is not palpable, the transthoracic approach, inserting the needle one interspace below the upper level of liver dullness in the midaxillary line, becomes the procedure of choice. Inasmuch, as the transthoracic method had been used in 12 of the 14 fatalities reported with needle liver biopsy[7], we have prefered the anterior abdominal approach whenever possible. It is worthy of note that each of the patients subjected to the transthoracic approach has complained of minor discomfort following the procedure, whereas those patients approached through the abdomen have not developed such discomfort.

Preliminary studies include bleeding time, venous coagulation time, prothombin time and blood typing. At the time of biopsy, the patient is placed supine on a table, the skin and subcutaneous tissues are infiltrated with procaine, and a small incision of the skin is made. The needle with its stylet in place is intraduced just to the peritoneum; the stylet is removed and a sterile syringe attached. With the needle in place, the patient is instructed to hyperventilate so that a period of apnea may be produced during which the actual biopsy can safely be taken. This maneuver is of particular importance when the transthoracic approach is used; for any motion of the diaphragm will move the liver at right angles to the inserted needle. With the anterior abdominal approach, this danger is obviated since the liver would move parallel to the long axis of the inserted needle during respiration. We have found, as a result of earlier studies on fresh cadavers, that if the needle is intraduced with an alternating clockwise and counter-clockwise rotation while, at the same time, constant moderate suction is maintained, the best specimens are obtained.

CASE REPORTS

Case 1 (Hosp. No. 155171): J. N., a 78 year old white male suffered a fracture of the right tibia on July 3, 1948. He was brought to the Delaware Hospital, in shock, and was given two units (500 c.c.) of Red Cross plasma. He later received 1000 c.c. of whole blood. Recovery was prompt and uneventful. He was discharged July 27, and followed in the out patient clinic.

On October 11, 1948, it was noted that the patient was jaundiced. He stated that his urine had become dark a few days before. The liver, though tender, was barely palpable. He was readmitted three days later. On admission, the patient was moderately jaundiced and thin, complaining only of moderate anorexia. Laboratory studies revealed 12 gm. hemoglobin; a WBC of 5,000 with a normal differential; icteric index, 81; a cephalin-cholesterol flocculation 3 plus in 48 hours; and serum proteins of 6.2 gm.% with reversal of the albumin: globulin ratio.

On October 18, a liver biopsy was performed, using the transthoracic approach. The patient's condition remained unchanged till October 23, when he became irrational. It became necessary to resort to large amounts of intravenous fluids as he became progressively more stuporous and finally comatose. He expired three days later.

Pathological Report: Biopsy of the liver in this case, taken 7 days after onset of jaundice, (Fig. 1) reveals many of the features of the icteric phase of infectious hepatitis as described by Mallory[14]. The most striking feature is periportal infiltration of both acute and chronic inflammatory cells with a preponderance of mononuclear cells. The hepatic cells are swollen and granular indicating the early stages of degeneration. There is also apparent what Mallory terms "lobular disarray", a loss of the normal well-defined lobular arrangement. Biliary stasis and a suggestion of bile duct proliferation are present in the sections. These findings are compatible with hepatitis either of the homologous serum (HS) or "infectious" (IH) varieties since there is no recognized histopathologic differentiation of these two conditions[3], [6], [15].

The post-mortem appearance of the liver, 8 days after the biopsy and 15 days after onset, microscopically showed far more advanced changes, revealing lobules that are faintly out-

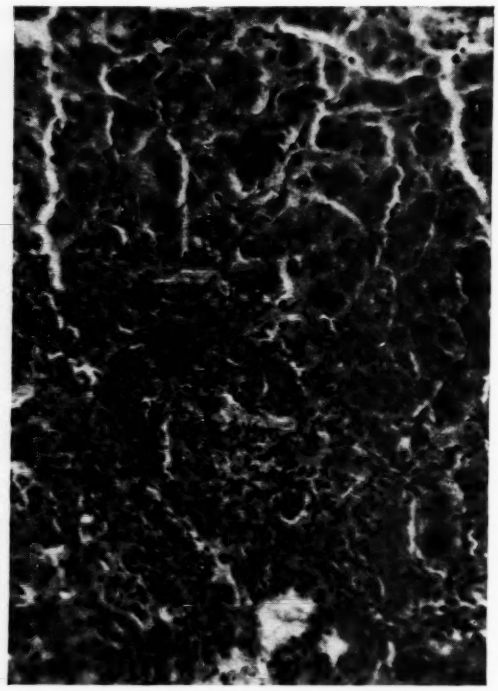

Fig. 1 — Liver biopsy (x254). Illustrating periportal infiltration of inflammatory cells. Case No. 1.

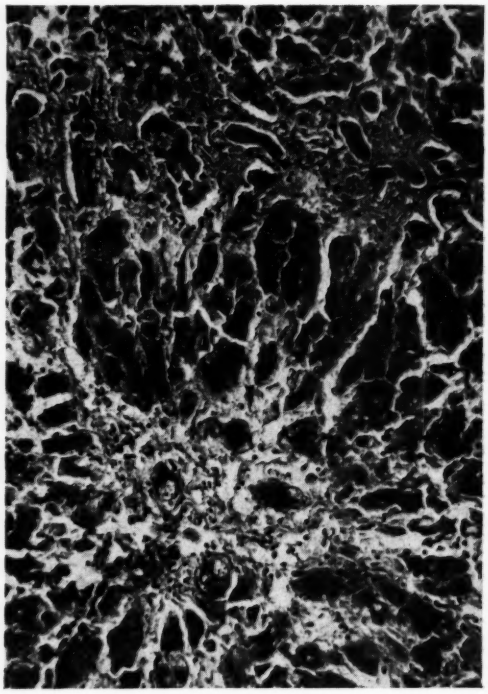

Fig. 2 — Post-mortem specimen (x200). Illustrating more advanced liver destruction. Case No. 1.

lined by a narrow rim of recognizable hepatic cells (Fig. 2). There is marked central necrosis. The cells in the central zone have disappeared and there remains only faintly acidophilic cellular debris. In the mid-zone, the nuclei are gone and the cell cytoplasm is finely vacuolated. There is marked bile duct proliferation but the previously described intense inflammatory reaction is no longer apparent. There is no discernible evidence of hepatic cell regeneration. Both the gross and microscopic post-mortem findings in this case are in accord with those described by Lucké[16] for fatal virus hepatitis.

Case 2 (Hosp. No. 156386): The patient, a 66 year old Negro male, was admitted to the Delaware Hospital August 30, 1948, with the chief complaints of anorexia and epigastric pain of one month's duration. One week before admission he noted the onset of dark urine. Physical examination revealed a well-developed Negro adult without evident weight loss. There was neither ascites nor jaundice. The liver edge was hard and nodular and could be palpated 2 Cm. below the level of the umbilicus.

Laboratory studies revealed a hemoglobin of 12 gm.; WBC of 8,400 with a normal differential; icterus index, 13; and cephalin-cholesterol flocculation test negative in 48 hours. A gastrointestinal series showed no abnormalities of the stomach or duodenum.

On September 8, 1948, a liver biopsy was performed using the anterior abdominal approach. The patient was then discharged and died at home several weeks later. Permission for autopsy was not granted.

Pathological report: The material obtained consists of several pieces of apparently normal liver and a few bits of tissue showing closely packed irregular glandular acini which vary considerably in size (Fig. 3.). The epithelial cells are hyperchromatic and invade the scanty fibrous stroma in some areas. These epithelial cells are fairly uniform in size and do not show mitotic figures in abundance. The diagnosis is adenocarcinoma of rather low histo-

Fig. 3 — Liver biopsy (x200). Showing area of adeno-carcinoma resembling bile duct origin. Case No. 2.

logic grade resembling carcinoma of bile duct origin.

Case 3 (Hosp. No. 156339): The patient, a 48 year old white male, was admitted to this hospital on August 26, 1948, with the chief complaints of jaundice and abdominal swelling. The onset of his present illness, four days prior to admission, occurred suddenly following a bout of drinking. He gave a history of consuming one quart of beer and one pint of wine daily over the past 4-5 years with irregular and inadequate diet. He was febrile and irrational, requiring tube feeding and abdominal paracenteses. The liver was palpable at the iliac crest. There was evidence of a developing collateral circulation within the abdominal wall and hemorrhoids were noted.

Laboratory studies revealed a hemoglobin of 9.8 gm.; an RBC of 3.0 million; a WBC of 6,200 with a normal differential; icterus index of 18; total serum proteins of 6.9 gm.% with a reversed A/G ratio; and a negative cephalin-cholesterol flocculation test.

On September 14, 1948, a liver biopsy was done using the anterior abdominal approach. Following the last abdominal paracentesis on Sept. 7, fluid did not accumulate again. His appetite returned and the liver edge receded to a point three fingerbreadths below the costal margin. He was discharged on Sept. 29, 1948, and has remained in fairly good health since that time.

Pathological report: Liver biopsy in this case reveals the typical pathologic changes of well-advanced Laennec's (portal) cirrhosis: marked periportal fibrosis with compression of the hepatic lobules, and extensive proliferation of the bile ducts. The hepatic cells also show slight fat vacuolization.

Needle biopsy specimens obtained from cirrhotic livers usually provided us with more adequate and better preserved "worms" of tissue than did the specimens from other types of livers. In our series of cases, we have observed that the tissue obtained from carcinomatous livers tends to fragment when released from the needle into the fixative (Zenker's solution).

Case 4 (Hosp. No. 158195): The patient, a 47 year old white man, was admitted to this hospital on November 16, 1948, for control of his diabetes. The patient had been unaware of his diabetes till four weeks prior to admission when he began to feel "generally run down", weak and drowsy. He had noted moderate polyuria for a few days before admission.

Laboratory studies revealed a hemoglobin of 15.7 gm. and a WBC of 8,000 with a normal differential count. The fasting blood sugar on admission was 208 mgm.%, the icterus index 15; the cephalin-cholesterol flocculation was 3 plus after 48 hours; the prothrombin time 67% of normal; and a blood serology was negative. Chest x-ray showed nothing more than slight enlargement of the hilar lymph-nodes. His diabetes was controlled by the administration of moderate doses of globin insulin (U-35 daily).

Physically, the patient exhibited a marked "tanning" of the face and a darkening of the forearms with a definite slate hue. The skin on the extensor surfaces of the forearms was dry and somewhat scaly. Interpretation of the pigmentation was confused by the fact that the patient had recently been in Florida. However, he stated that the pigmentation of the forearms had appeared only one month previ-

ous to admission at a time when he was feeling "run down" and had remained indoors most of the time. In addition the liver was palpable three fingerbreadths below the right costal margin. It was very firm and smooth.

On November 27, a liver biopsy was performed with the anterior abdominal approach. The patient was discharged two days later.

Pathological report: Examination of the tissue received in this case shows the characteristic changes of portal cirrhosis with the added feature of a heavy deposition of a deep moderately refractile golden brown pigment. This pigment deposition is heaviest within the periportal fibrous tissue but also occurs within the cytoplasm of the parenchymal cells, Kupfer cells and bile duct epithelium. When stained with potassium ferrocyanide, the pigment takes a strong Prussian blue reaction for iron and is thus identified as hemosiderin. In this case liver biopsy merely confirmed the clinical impression of hemochromatosis arrived at by the triad of pigmentation of the skin, diabetes mellitus and hepatomegaly. Most authors writing on the subject of hemochromatosis agree that the diagnosis of this condition can be considered almost certain by the microchemical demonstration of iron in the skin [17, 18, 19, 20]. Pigmentation of the skin is not always present, however, and in such cases liver biopsy has been used to make the diagnosis during life. [7,21,22]

Case 5 (Hosp. No. 156109): The patient, a 66 year old colored male, entered the Delaware Hospital on August 16, 1948, with the chief complaint of enlargement of the abdomen of one year's duration. During the preceding year, he had been troubled with occasional moderate swelling of the ankles. The stools had been clay-colored for one year. He had noticed no jaundice and did not complain of gastrointestinal or genitourinary symptoms. There had been a weight loss of undetermined amount.

Physical examination disclosed a moderately emaciated elderly Negro male lying quietly in bed. The sclerae were yellow. A few fine rales could be heard at both lung bases. The heart sounds were distant with normal rate and rhythm. No murmurs were heard. The liver was grossly enlarged, extending 10 cm. below the right costal margin and over into the left side of the abdomen. It was immobile, had a hard consistency and felt grossly nodular.

Laboratory studies revealed a hemoglobin of 13 gm.; a WBC of 5,000 with a normal differential; icteric index of 37; a 3 plus cephalin-cholesterol flocculation test after 48 hours; and a prothrombin time of 65% of normal. The urine showed a 1 plus test for albumin but was otherwise within normal limits.

A liver biopsy utilizing the anterior abdominal approach was done on August 24. The patient's pulse and blood pressure remained normal but he became febrile that afternoon and continued to run a fever until his death two days later. The cause of the fever remained unexplained as he showed no signs of increased abdominal discomfort during the time between biopsy and death. The chest findings had not changed since August 23 when they were reported negative on x-ray. Permission for autopsy was not granted.

Pathological report: The material obtained in this case was scanty and fragmented. No recognizable liver tissue is seen in the sections made from the material. Several clumps of large, hyperchromatic cells are seen among the numerous erythrocytes (Fig. 4). These

Fig. 4 — Liver biopsy (x860). Showing clump of malignant epithelial tumor cells. Two mitotic figures are apparent. Case No. 4.

cells show marked variation in size and shape with relatively little cytoplasm. One clump contains two mitotic figures. These cells are unquestionably malignant epithelial tumor cells, but the primary site of the tumor cannot be ascertained from the scanty material available.

DISCUSSION

Liver biopsy potentially serves three main purposes: (1) It may either confirm or definitely establish a diagnosis; (2) It provides a method for following the progress of chronic liver disease, such as Laennec's cirrhosis; and (3) it may, as in virus hepatitis (IH), clarify the pathogenesis of certain diseases where previously only the postmortem pathology was known, or where the mortality incidence is so low that virtually nothing of either the ante or postmortem pathology is adequately known. It is in the last of these situations that the outstanding work of Iverson and Roholm and others has contributed so much to a new understanding of the pathogenesis of these diseases.

Obviously it is for the trifold purpose of diagnosis, observing progress and evaluating therapy that needle biopsy of the liver will have its greatest usefulness as a general hospital procedure. Fourteen biopsies have been performed during the six months since we initiated the procedure in this hospital. Of these, five have shown Laennec's cirrhosis, two hemosiderosis, two virus hepatitis, two carcinoma, and one fatty metamorphosis. Two were reported as essentially normal. The amount of material obtained in one patient with cirrhosis was unsatisfactory. Seven of the 14 biopsies have been of decided assistance in establishing the diagnosis. Both cases of virus hepatitis, occurring in men over 50 years of age, had received the presumptive diagnosis of obstructive jaundice due to malignancy until the biopsy reports were received. Both of the cases in which the biopsy was reported as normal were diagnostic problems in which both time and expense were saved so far as further studies toward the cause of their hepatomegaly was concerned. The two cases of hemosiderosis were undiagnosed before liver biopsy. One of these had no evidence of diabetes and skin biopsy failed to demonstrate the presence of iron-bearing pigment. One case of carcinoma had not been so diagnosed prior to biopsy. Sufficient time has not yet elapsed for adequate follow-up studies of the cirrhotic patients.

Needle biopsy of the liver has two definite disadvantages. Koch and Karl[7], in a review of the nearly 1500 biopsies previously reported in the literature, found 14 fatalities due to the procedure. This mortality, though very low, will probably be further decreased in the future through increased use of the anterior abdominal approach in preference to the transthoracic route. Secondly, the specimen obtained may readily fail to reveal the presence of localized disease of the liver. Even where needle biopsy demonstrates one clear cut disease, the presence of additional localized disease cannot be ruled out.

Peritoneoscopy with biopsy of the liver has the distinct advantage in that direct visualization of the liver is permitted. The presence of localized disease may thus be discovered whereas it might well be missed by needle biopsy. Material obtained with use of the peritoneoscope is usually from the edge of the liver and frequently microscopic examination of such tissue reveals little other than normal capsule or pericapsular fibrosis. In comparison, the needle biopsy specimen represents a much greater sampling of the parenchyma. Peritoneoscopy, besides, is an uncomfortable procedure necessitating the use of pneumoperitoneum.

The contraindications to needle biopsy of the liver are listed as follows: (1) a bleeding tendency shown in preliminary studies; (2) suppuration; and (3) any condition preventing adequate immobilization of the diaphragm during the procedure.

It is our conclusion that this procedure is a safe one in experienced hands and it has proved to be of considerable value as a diagnostic procedure, a conclusion that warrants its further use and inclusion among the diagnostic armamentarium of the general hospital.

SUMMARY

1. Five representative cases in which liver biopsy aided in the diagnosis and the pathological findings are reported.

2. The use of the needle liver biopsy is described and discussed as a general hospital procedure.

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THE PROBLEM OF SQUINT IN CHILDREN*

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Frequently, a mother, consultating the ophthalmologist for the treatment of a squint in an older child, will remark that the visit was delayed because the family physician assured her that the child would outgrow the deformity. I would like to point out that such advice is not compatible with present day teachings. The earlier that a squint developes, and the longer that treatment is deferred, the more likely that a cosmetic cure only will be obtained.

Squint—commonly referred to as cross-eyed or wall-eyed—is a definite social and psychological handicap to the child in developing personality patterns. Playmates are cruel to the child with squint, taking great delight with taunts and unkind remarks. Thus, it is no wonder that almost without exception adolescents with squint have marked inferiority personality patterns. From the psychological standpoint alone, early correction of a squint is indicated, if possible, before the school age of four to five years.

In the correction of squint, the therapeutic measures that may be employed are:

1. Correction of errors of refraction, with glasses.
2. Occlusion of the fixing (better) eye.
3. Orthoptic training.
4. Surgery.

Correct refraction under a cycloplegic is the first requisite in the treatment of squint. Retinoscopy will often reveal a high hyperopia, or farsightedness, and the wearing of glasses will often reduce the deviation or relieve it. If there is subnormal vision in the squinting eye, glasses alone will not restore it. Therefore, some estimation of the visual acuity is desirable, for by the time that the average parent is induced to bring the child with squint for examination the deviating eye will show subnormal vision. Visual tests are an excellent means of impressing the mother how much damage has been done and to enlist her cooperation in the treatment.

If the vision is subnormal then an attempt must be made to restore this lost vision. This is accomplished by occlusion of the better eye, thus forcing the use of the poorer eye. Occlusion to be effective must be total and continuous for weeks at a time.

When vision of better than 20/70 is obtained in the squinting eye, orthoptic treatment may be commenced. Selected children between the ages of four to eight will cooperate in orthoptic treatments. Orthoptics is the functional part of the cure for squint, aimed at teaching fusion or the binocular use of the eyes. If the squint is of low degree, it is possible that with the adequate development of fusion, surgery can be avoided. However, even if fusion is obtainable in a squint of high degree, surgery will still be necessary to approximate ocular parallelism. Where orthoptic training is utilized both pre- and post-operatively, the results are far more satisfactory than with surgery alone.

Surgery is only used to obtain parallel visual axes. The surgical procedure has no affect on the visual acuity or the binocular coordination of the eyes. To subject the patient to a surgical correction without first treating the subnormal vision or attempting to develop

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Fig. 1. Typical example of a convergent squint. Age 4; age of onset 1 year. Five other children in family, two of whom have convergent squints demonstrating the heredity factor. Vision in right eye is 20/200; left eye 20/30.

Attempts at occlusion of the better eye have not been successful due to lack of cooperation. The important thing is the low vision which usually develops in the deviating eye. Unless this is corrected at an early age, the amblyopia will continue the rest of the patient's life.

fusion will result in nothing more than a cosmetic cure in 75 to 80% of the cases. The patient thereafter will continue to use the good eye and suppress the vision in the previously squinting eye. In cases of low visual acuity

Fig. 2. Example of patching or occlusion of the good eye in order to force the use of the squinting or amblyopic eye. Present age 7; age of onset 3. Vision in right eye 20/200; left eye 20/30. This patient was treated in the clinics from age of onset to the present with glasses alone with absolutely no improvement in either the squint or the low vision, demonstrating that glasses alone will seldom improve these patients.

with no fusion faculty there is the added possibility that the squint will recur following surgery.

In conclusion I would like to stress the importance of diagnosing and treating squint at the earliest possible age if we wish to achieve more than parallelism of the visual axes. No child is too young to examine if a squint is suspected. Even visual acuity may be reliably estimated in an infant. Also, these patients in the younger age group afford us the best opportunity for correction of the squint with less surgery or in favorable cases with no surgery. Even more gratifying is the obtaining of single binocular vision by persistent treatment when started early. All too often our

Fig. 3. Demonstrating the use of orthoptic training which is the functional part of the cure aimed at teaching fusion or the binocular use of the eyes.

so-called good results refer to eyes that are cosmetically acceptable to the parents. It has been my observation that parents are seldom informed that there is more to the correction of a squint than restoring the parallel position of the eyes. With a cosmetic cure they are under the assumption that naturally the child sees equally and together with both eyes. The disappointment of the child is evident years later when he is rejected for a desired job or position due to the defect. The ultimate end to be desired in squint is a functional as well as a cosmetic cure.

Medical Arts Bldg.

THE POST-ANESTHESIA ROOM

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In the immediate postoperative period, the patient may require a variety of services. At this time any or all of the following treatments may be indicated.

1. Maintenance of a clear airway for breathing.
2. Oxygen administration.
3. Intravenous administration of blood, plasma or fluids.
4. Administration of drugs such as morphine, penicillin etc.

Manifestly such therapy may be better performed by specialized and trained people who may be much more conservatively employed if their efforts are exerted in one central location. A room near the operating suite is equipped with the necessary instruments and used for this purpose. Proximity to the operating theatre also makes the services of the anesthesiologist instantly available and the shortest possible period of time is consumed in transport of the patient postoperatively. Readily at hand is the means of treatment of respiratory and circulatory emergencies, should they develop.

The room and equipment are, however, secondary in importance to the nurse in charge, for her intelligence, training and energy determine the worth of this service.

Any young nurse searching for a specialized field of endeavor would do well to consider the pursuit of this interesting and important work. At present a very small percentage of the hospitals in this country have such rooms. When the advantages derived therefrom become generally appreciated there should be many positions available.

THE CHARGE NURSE: HER TRAINING AND DUTIES

The charge nurse should first be a good nurse, capable and dependable, with a placid disposition in emergencies, and willing to work irregular hours.

Her training will include a practical understanding of the various anesthetics and their administration, surgical procedures, intravenous therapy, inhalation therapy, resuscitation methods, and the patients' mental and physical reactions in the postoperative period.

At the conclusion of operation the patient is taken to the post-anesthesia room by the anesthesiologist who explains the operative and anesthetic course to the charge nurse. He details any special reactions that are to be looked for and outlines any immediate postoperative therapy that is indicated. The charge nurse, then, assumes the responsibility of carrying out such specific therapy, while performing the more routine duties of blood pressure, pulse and respiration determinations as well as the general care of the patient.

It is usually possible for her to care for several cases at one time. In this way, she replaces with her skilled services, the efforts of many untrained people who would be required if the patients were dispersed throughout the hospital in their individual rooms.

She may also serve as a very competent instructor to student nurses in postoperative care. This is a branch of nursing service which is often delegated to the least experienced students and is usually inadequately supervised. The concentrated case material here, presents an opportunity for well directed effort in this important field.

The period of treatment and/or observation in the Post-Anesthesia Room varies considerably in each case. It is our practice to return patients to their rooms only when they have regained consciousness and specific, immediate needs have been met.

EQUIPMENT

Although this can be very elaborate, basic need exists for certain fundamental items, as follows:

1. Airways of varying sizes, from infant to large adult.
2. Mouth props (wooden wedges for prying clenched jaws apart).
3. Suction apparatus, with several catheters.
4. Oxygen equipment:
   a. Nasal catheter type.
   b. Demand flow type.
   c. Positive pressure type.

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5. Laryngoscope and endotracheal tubes.
6. Intravenous apparatus with an adequate number of needles of different sizes, a supply of I. V. fluids, a cutdown set, and a small supply of blood plasma.
7. Sphygmomanometer and stethoscope.
8. Some form of record system.
9. A supply of drugs most commonly used.

Additionally, it is desirable, if possible, to have a water supply, telephone, and call system.

These should all be housed in a well lighted room of ample size located close to the operating suite but sufficiently separated from preoperative patients to prevent them from being disturbed.

EXPERIENCES WITH THE POST ANESTHESIA ROOMS AT THE DELAWARE HOSPITAL

This room began to function on June 23, 1948, in charge of Jean B. Cooling, R. N., under supervision of the Director of Anesthesia.

From June 23, to December 20, 1948, a period of nearly six months, 1,222 cases have been treated here. During this period a total of 2,310 anesthetics were administered to patients other than obstetrical. Obstetrical patients are not treated here because of separate facilities for their care. Out-patients who are anesthetized during the day are admitted whenever not fully reacted following anesthesia, and nearly all in-patients from the operating rooms are observed or treated here.

The hours of use of the room are somewhat elastic, depending on the need, but in general patients are admitted here from 8 A. M. to 5 P. M. and remain until removal to their rooms is considered justifiable.

Private duty nurses are asked to attend their own patients in the post-anesthesia room under the supervision of the charge nurse. Members of the patients' families are not admitted to the room.

The ready availability of oxygen apparatus has caused us to use it quite freely. We are continuously reminded of the difficulties that would be encountered if this equipment were dispersed over the hospital or available only through a central supply system. Oxygen inhalation has proven very valuable in a number of ways not connected with respiration. It is marked aid in combatting shock and reduces considerably the excitement seen in a few patients following narcosis.

The duration of the patients' stay in the room is extremely variable according to individual needs. The shortest time has been fifteen minutes and the longest four hours and ten minutes.

In general, the reception accorded this service by surgeons, families, patients, and nurses has been gratifying.

SUMMARY

Some facts concerning the equipment and operation of a post-anesthesia room are presented.

It is our belief that this service offers many advantages to the patient postoperatively, to the anesthesia department, and to the hospital in general.

At present, formal training in this type of work is not available to our knowledge, but the basic principles of necessary instruction have been worked out. We shall be glad to extend the results of our experiences to qualified professional personnel.

CLINICOPATHOLOGIC CASE RECORD

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PRESENTATION OF CASE**

DR. COOLEY: A twenty-two-year-old Negro male was admitted to the hospital in a stuporous state.

The patient, a known hypertensive of unknown severity of four years' duration, had experienced occasional attacks which varied from "dizzy spells" sometimes associated with blurred vision to complete loss of consciousness preceded and followed by severe throbbing generalized headache. Vomiting and generalized convulsions had occurred with these attacks which seemed to come on without provocation.

On the day before admission, the patient had complained of headache and loss of appetite. He was brought to the Emergency Ward after having been found unconscious on his kitchen floor.

The past history revealed no serious illnesses or operations. The family history was non-

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**Delaware Hospital Case No. 147763, presented at Staff Clinical-Pathological Conference.

contributory and a complete systemic review added nothing of importance.

Physical examination revealed a well developed and well nourished young Negro male lying quietly in bed. The skin was warm and perspiring. There was a small laceration over the right eye. The pupils were round, regular and equal, reacting to light and accommodation. There was slight convergent strabismus. The fundi showed marked arteriolar spasm with arterio-venous crossing defects and increase in the light reflexes. There was no apparent choking of the discs. The teeth were carious and the tongue coated. The lungs were clear to percussion and auscultation. The cardiac apex beat was visible in the fifth interspace 10 cm. to the left of the mid-sternal line. There was accentuation of the valve tones and a prolonged, low pitched, apical systolic murmur was audible.

Neurological examination disclosed weak cremasteric reflexes. The tendon reflexes were slightly hyperactive and equal. There was no ankle clonus or pathological reflexes. The cranial nerves were intact.

The temperature was 98°F., the pulse 120, and the respirations 16. The blood pressure was 220 systolic, 160 diastolic.

Examination of the blood showed a hemoglobin of 116 per cent and a white-cell count of 8,100 with 68 per cent neutrophiles, 22 per cent lymphocytes, 2 per cent monocytes, 6 per cent eosinophiles and 2 per cent basophiles. The urine specific gravity was 1.009, a trace of albumin was present and there were occasional hyaline casts per high power field. The blood sugar was 105 mg., the urea nitrogen 20 mg., and the serum phosphorus 3.2 mg. per 100 cc. Examination of the spinal fluid revealed a pressure of 225 mm. of water and fluid that was clear and colorless. There were 5 white-cells and a trace of globulin was present (Pandy). The colloidal gold curve was 2111000000 and the serology negative. The blood serology (Mazzini) was negative. A urine concentration test (Fishberg) revealed a maximum concentration of Sp. G. 1.019.

Shortly after admission, the patient developed a grande mal type of convulsion followed by deep sleep. Thereafter his condition did not change and he complained only of occasional mild headache. The blood pressure was 190 systolic, 150 diastolic. The white-cell count was 11,700, with no appreciable change in the differential count. The red-cell count was 5,600,000, with a hemoglobin of 113 per cent (17.6 gms.).

On the fourth day, he had two generalized convulsions followed by unconsciousness and sleep. The temperature was 99.4°F. The blood sugar, at this time, was 155 mg, the urea nitrogen 82 mg., and the creatinine 3.5 mg. per 100 cc. A third convulsion was followed by unconsciousness and prolonged stupor.

On the fifth hospital day, the temperature rose precipitously to 107°F.(R). Intermittent seizures continued. Examination of the patient at this time revealed moderate nuchal rigidity and a Kernig's sign was present. The knee jerks were absent. The pupils reacted sluggishly to light. The skin was hot and moist. The pulse was 140, respiration 48, and blood pressure 160 systolic, 125 diastolic. A blood culture was taken which subsequently showed no growth and blood smears were negative for malarial parasites.

On the morning of the sixth hospital day, the patient, after having been comatose for 48 hours, expired.

DIFFERENTIAL DIAGNOSIS

DR. SMITH: In brief, this is a case of a twenty-two-year-old colored male known to have had hypertension for four years. He was first seen in our Emergency Ward in a stuporous state. The previous medical history is significant in that the patient had a number of attacks in which he experienced dizziness, blurred vision, throbbing headache, vomiting and generalized convulsions followed by loss of consciousness. These attacks are said to have varied in severity. We are not told over how long a period of time they had been occurring.

The patient's blood pressure, on admission, was 220 systolic, 160 diastolic. The only pertinent findings on initial physical examination were: arteriolar spasm with arterio-venous nicking or compression on examination of the eyegrounds and an apical systolic murmur. It is noted that the patient developed a grande mal type of convulsion a short time after admission.

At this point, we can look into the various diagnostic possibilities.

With a history of convulsions, although here we are not certain as to the type or frequency of the attacks, we should first consider epilepsy. There was no mention of an aura preceding any of the attacks. Evidently, there is no previous history of cerebral trauma, nor is there any history of a familial tendency.

Epileptiform seizures may occur in uremia. From the laboratory studies, it may be said that this patient was not in uremia at the time of admission. On the fourth day, however, the blood urea nitrogen was found to be quite elevated. Other conditions remaining to be considered are: infection involving the central nervous system, brain tumor, and cerebral-vascular accident.

Neurosyphilis is a possibility. Here, we may expect to find a very bizarre clinical picture. Syphilis of the cerebral vessels may cause hemorrhage; when it does, it involves patients in the younger age groups. A weakly positive colloidal gold curve, such as was found in this case, may have little or no significance. On the other hand, it should not be ignored entirely insofar as the possibility of neurosyphilis is concerned even though we have negative serologic reactions reported with both blood and spinal fluid.

This patient was known to have been hypertensive for four years and, because of its severity in conjunction with the patient's age, we must consider the malignant form of essential hypertension. Cerebral hemorrhage is a frequent sequelae in this disease. Were this present, one would expect to find blood in the spinal fluid. In cerebral thrombosis, on the other hand, the spinal fluid shows no blood usually and the onset is more gradual. The patient's age is against thrombosis although thrombosis may occur on the basis of a polycythemia or sickle cell anemia.

With the progressive character of the patient's symptoms, we must also consider brain tumor. Headache with brain tumor is likely to be more constant. One might also expect to see associated vomiting, choked disk and localizing neurological signs which are not described in this case.

The presence of hypertension in one so young forces me to think of coarctation of the aorta and also pheochromocytoma. I think we can safely assume that the former condition was not present, but I do not see how we can eliminate the possibility of a pheochromocytoma. An abdominal mass was apparently not palpated. The patient's blood pressure was persistently high. The hypertension seen in pheochromocytoma is persistent in type in from 50 to 90 per cent of cases, whereas it is paroxysmal in 10 to 50 per cent.

My choice as to the diagnosis is malignant hypertension with cerebral-vascular pathology. I cannot, however, rule out the possibility of a pheochromocytoma.

A PHYSICIAN: The fact that this relatively young patient was discovered unconscious in his home and expired six days later after having developed central nervous system signs and symptoms makes one think of the possibility of a ruptured congenital aneurysm. Earlier symptoms of intermittent dizziness, visual changes, headache and convulsions might be explained by episodes of leakage.

ANATOMICAL DIAGNOSIS

Pheochromocytoma of Left Adrenal

Cerebral edema

Pulmonary congestion and edema, early bronchopneumonia

PATHOLOGICAL DISCUSSION

Postmortem examination revealed two main lesions. The immediate cause of death was edema of the brain. The brain weighed 1,525 grams and was generally softened. There was marked ironing-out of the cerebral convolutions. As so often is the case, there was no evidence of subdural, subarachnoid or cerebral hemorrhage, or abnormalities of the vessels to account for the neurological signs observed during life.

Continuous with the upper pole of the left adrenal gland was a rounded, smooth, tumor mass measuring 7 cm. in its greatest diameter. The mass impinged upon the renal pedicle. The cut surface of the tumor was multi-colored and showed areas of necrosis, hemorrhage and cyst formation.

Microscopically, the growth shows a general resemblance to adrenal medullary tissue, consisting of loose groups of polygonal and irregular cells with intervening vascular channels. These cells vary greatly in size and shape and have a granular cytoplasm which

on differential staining is shown to be chromaffin. In some areas, the cells form large alveolar structures surrounded by narrow bands of fibrous connective tissue. In other areas, there is considerable hemorrhage and necrosis. A few giant cells are seen, but mitotic figures are not present in unusual number.

TRUMAN STRATEGY REVEALED

Strategy planned by "realistic medical-minded 'insiders' in the Truman Administration" to put over a Federal health insurance act is revealed in the January issue of *Medical Economics*.

In a signed article, Wallace Werble, Washington newsman, states that while the President and his political aides will press Congress for immediate passage of the full program, inside plans call first for enactment of a series of four auxiliary "targets." These are listed as:

"Establishment of a Cabinet Department of Health, Security and Education.

"Federal aid to medical education, either alone or as part of a program of aid to education in general.

"Federal assistance to the states for the establishment of adequately staffed, full-time public health units in every county.

"Increased authorizations and appropriations for expanding the Federal grants-in-aid program under the Hill-Burton Hospital Construction Act."

The article in this business magazine for physicians continues with the flat expression of opinion that "unless there is another political upset, national health insurance won't be one of the accomplishments of Congress at its present session."

"Public interest and enthusiasm haven't quite yet reached the pitch needed to jam through a program of this kind over the vigorous opposition of organized medicine, supported by minority Republicans and conservative Democrats in key places on Capitol Hill.

"In short, the realists are asking for what they think they can get out of Congress on the theory that they can thus best prepare the way now for national health insurance later."

The article considers that authorization by Congress of a Cabinet Department of Health Security and Education is "probable," and says Federal Security Administrator Oscar Ewing is "the probable choice."

"The proposal for Federal aid to medical education is based on the belief in Government quarters that a medical manpower shortage is the most critical problem facing the health of the nation today," Werble continues in his *Medical Economics* forecast. "Those who hold this view estimate that the nation can use an additional 50,000 to 60,000 people in the health professions (doctors, dentists, nurses, public health specialists, and hospital administrators.)"

Sufficient organizational backing is seen to secure enactment of a bill to provide Federal aid for public health units. In conclusion, the article states:

"The Government hopes eventually to evolve a program under which will be at least one major hospital in each state, connected preferably with the state university medical school or with some other teaching organizators.)"

The responsibility for planning and providing adequate hospital facilities for the tuberculous is a public, not a private obligation.—A. W. Fiske (Ohio State Representative) *Ohio Pub. Health*, Sept., 1948.

In the treatment of pulmonary tuberculosis, complete bed rest is the foundation upon which the physician builds. In addition to this, collapse therapy of various kinds is used to provide local rest to some portions of the lung to initiate healing of the diseased process, to correct an unfavorable mechanical situation such as the presence of a cavity in the lung parenchyma, or to speed up the healing process. With the addition of collapse therapy one may shorten the time of complete bed rest, allowing the patient to be ambulatory and return to a productive occupation at an earlier date.—Harold Guyon Trimble, M. D., *Am. Rec. Tuberc.*, May, 1948.

+ Editorial +

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MARCHING FORWARD

As the year begins most of us are inclined to reflect over the events of the past year which have been of vital importance. No medical man can do this without some degree of self-evaluation, considering the failures and successes, the accomplishments along with those things we did not get done.

Now, we in medicine should review our purposes, aims and methods, eliminating emotional reactions toward ourselves, toward our relationship with our confreres, and opportunities.

What are the most important benefits that organized medicine has to offer:

1. More precise knowledge as to the etiology of various diseases.
2. Better intra- and extra-mural facilities for the care and treatment of our patients.
3. More and better research facilities.
4. Better educational opportunities in all branches of medicine.
5. More adequate compensation for medical services.
6. Closer relationship between medicine and allied services—recognition of team-work.
7. More adequately organized to fight against "Federal Medicine" and a strong desire on the part of the majority of the members of organized medicine to sustain the freedom of private practice of medicine.

To maintain and to continue to improve the above achievements, each member of our profession should consider it his solemn obligation to work unceasingly and intelligently toward solving many medical problems presently in existence, regardless of the sacrifices he must make.

Nationally we must endeavor to relieve the economic burden of each sick person and to see that medical care is available to him. There are many ways to achieve this goal without jeopardizing the freedom of our patients and of the medical profession. Many plans have been suggested to our Congress.

I am in full accord with Dr. Gilson C. Engel, President of the Pennsylvania Medical Society, who has proposed a ten point plan as "Responsibilities of the Government in the Health of the Nation," which is less costly and does not regiment the medical profession or the people.

We have also many serious medical problems in our state, to cite only a few: the serious political financial and structural handicap of our Wilmington City Board of Health; the inability of our coroners to obtain the services of qualified and well experienced medical examiners; a lack of organized preventive medical out-patient work, (in all branches of medicine, particularly of seriously disabling diseases); a lack of proper support of the newly established preventive psychiatric hospital; a lack of adequate scientific seminars for our rural medical members; inadequate public education in the understanding of various medical and allied problems.

To improve, correct and develop the above situation, our Society has some twenty-five standing and special committees with definite

functions for the above purposes. The members of the Standing Committees are elected by the House of Delegates of the Society, while the members of the Special Committees are appointed by the President.

It has been my privilege and honor to appoint well qualified members for each Special Committee. I expect the chairmen of these committees to become the inspiration of their group. Every committee should have at least three meetings during the year and prepare and submit to the House of Delegates a guiding and inspiring report. The inspiration must come from inner drives, unselfish motives, and high principles. We must assume our responsibilities more seriously if we are to fight successfully against socialized medicine.

M. A. TARUMIANZ.

MISCELLANEOUS

Fishbein Answers Social Planners On Health

CHICAGO—In an article entitled "Health and Social Security" in the December 25, 1948 issue of the *Journal of the American Medical Association,* Dr. Morris Fishbein says that "the problem of providing medical care wherever needed is not nearly as simple as many economists would lead the American people to believe."

"Again and again political leaders have denied that nationwide compulsory sickness insurance is socialized medicine," the editor of The Journal stated, adding: "Yet the nations that embark on such programs move inevitably into a socialized state in which mines, banks, transportation and practically all public services become nationalized, private responsibility and ownership disappear, individual initiative is destroyed and the result is a socialized state. At the same time that many of our political leaders oppose communism they move toward communism by embracing socialism."

In his article dealing with medical economics, Dr. Fishbein reviews the amount of money which the 80th Congress appropriated for health and medical care of the American people.

"Few persons realize how greatly your federal government enters into the care of the sick under existing legislation," the article says. "In 1948 the federal government assumed the total cost of approximately $6,000,000,000 for medical, hospital, educational and welfare needs of veterans. Benefits were paid to more than 2,000,000 persons under old age and survivors' insurance programs."

He reviewed many of the health bills passed by the 80th Congress and then discussed Federal Security Administrator Oscar Ewing's report to the President, entitled "The Nation's Health," which Dr. Fishbein says "comes far indeed from being anything resembling a scientific document."

"Almost from the first it was apparent that Mr. Ewing was stacking his executive committee," Dr. Fishbein says and "what came forth was a shrewdly contrived document, designed to break down the confidence of the American people in their medical care and pointing repeatedly to compulsory sickness insurance as the cure for misrepresentation that the document sets forth." Continuing, the article says:

"A peculiar folly is the suggestion that every state should have a medical school and a medical center around the school. That type of broad generalization could have been made only by someone totally lacking in a knowledge of medical education and its problems. It will take far more than 10 years to accomplish that objective.

"The report says that a scant 20 per cent of our people are able to afford all the medical care they need—and this in a nation with the highest standard of living of any nation in the world. Who determines how much medical care people need? What kind of medical care meets the needs of the American people? We have in the United States some 200,000 physicians, 16,000 chiropractors and 7,000 or 8,000 osteopaths, with perhaps 15,000 or 20,000 more nondescript healers of every type from faith healing to the utilization of electric gadgets. How much could be saved by the elimination of this borderline quackery? Bear in mind that no other nation in the world is subject to the amount of medical quackery that we seem to tolerate and support.

"In England, following the adoption of the National Health Act which promised everyone in England free medical service and free hospitals, free eyeglasses and free teeth, as well as everything else free in the field of medicine, the service has been marked by utter in-

ability of the doctors, the hospitals, the pharmacists or the dentists to meet the demands placed on them by a great rush of people who wanted perhaps simply to find out how the system works.

"My personal observations in England led me to the opinion that the quality of medical service rendered under the National Health Act would never be satisfactory to the average American laborer or farmer.

"Nowhere else in the world are people as free from the fear of epidemic disease or from the danger of preventable death as in the United States. Obviously we have not yet reached perfection. Anyone familiar with the history of disease would state positively that mankind may never reach perfection in this regard. Disease itself is not static but constantly changing One need only compare the leading causes of death in 1910 with those of today to know that in the short span of two generations there have been vast changes in our scientific approach to the problems of medical care.

"We need no revolution to advance against disease at this tremendous rate of the past forty years, nor do we need a revolution to intensify our progress. The establishment of a compulsory sickness insurance system which would inevitably degrade and deteriorate the medical profession would represent a revolution and would with certainty deteriorate the quality of medical care rendered to our people. Once a nation has embarked on such a program, the ability to retrace the steps becomes less and less with every year that passes. As the years go by, the quality of medical education deteriorates. As the years go by, young men seek opportunity to enter other professions than medicine. Research fails to attract the type of men who in the past have given us the discoveries that have removed the fear of tuberculosis and pneumonia and of epidemic disease.

"With what sophistic explanations will those who propose to tear down the great edifice of medical education, medical research and the quality of medical care that we have established in this country and to replace it with a bureaucratic civil servant type of medical care justify their conduct in the years to come?"

Voluntary Insurance In The U. S.

More than 52,000,000 people, or well over one-third of the total population of the United States, are now protected under some form of voluntary hospital expense insurance, while voluntary surgical expense and medical expense insurance plans, newer types of protection, cover approximately 26,000,000 and 9,000,000 respectively.

At the same time, more than 31,000,000 persons, over half the employed civilians in the country, have benefits for loss of income due to disability, the basic type of protection sold by private insurance organizations writing accident and health insurance.

These figures, which represent the number protected at the start of last year, were announced yesterday by John H. Miller, chairman of a committee formed by a number of trade associations of insurance companies which has just completed a survey of voluntary accident and health plans in this country. The findings, which are based on a nationwide analysis, represent the first comprehensive survey of such plans, embracing not only those individuals protected by insurance companies but also those covered by the Blue Cross and all the other types of organizations providing this protection.

"These figures demonstrate how extensively the American people have undertaken the job of establishing their own protection, through private channels, against the costs of sickness and accident," Mr. Miller said. "Plans protecting against hospital, surgical and medical expenses have grown up almost entirely in the past ten or twelve years. The growth of these plans has been accelerated since the end of the war, giving promise that much more nearly complete protection for the population will be secured on a voluntary basis in the future. The extent of voluntary coverage and the rapid rate of growth shows that private enterprise is well able to meet the public need for this essential protection although, admittedly, much more remains to be accomplished. Existing coverage extends to all income levels of those regularly employed, often with employer financial support.

Detailed figures on a comparable basis for all the 52,000,000 covered by hospital insurance are not available for all types of cover-

age for past years, but the number of persons covered for hospitalization under group insurance policies and under Blue Cross plans, the principal types of coverage, is 56% greater than at the end of 1945 and 241% greater than at the end of 1941. Surgical and medical insurance plans have been developed more recently than hospitalization plans and are growing at an even faster rate.

The 31,000,000 persons insured against loss of income due to disability actually represent more nearly complete coverage of this need than does the number insured for hospital expense, since protection against loss of income is needed only by those with earned incomes. The coverage, of course, serves to protect those dependent upon the income producers as well as the individuals insured. This protection against loss of income has been sold by insurance organizations or provided directly by employers for a considerable time but has experienced a greatly increased rate of growth in recent years. "The extent of this protection," Mr. Miller said, "is evidence that in this field also voluntary plans can adequately insure workers against the loss of income due to disability."

The carriers insuring these people against hospitalization expense include: insurance companies and fraternal societies, with an aggregate of nearly 21,000,000 covered; Blue Cross plans and plans sponsored by medical societies, with 28,000,000; plans in the bituminous coal and other industries, private group clinics, university health plans, and consumer-sponsored groups, with an aggregate of more than 3,000,000.

The surgical benefit plans were written by insurance companies and fraternal societies on more than 15,000,000 persons, with the other organizations insuring 11,000,000 for these benefits. Medical expense plans were written by the insurance companies and fraternal societies on 2,000,000, by medical societies and Blue Cross affiliates on 3,000,000, and by the other organizations combined on an additional 4,000,000.

Benefits for loss of income due to disability are provided for nearly 19,000,000 by insurance companies and fraternal societies. 9,000,000 more are protected by paid sick leave programs and over 3,000,000 by mutual benefit associations, union plans and other methods.

OBITUARIES

CHARLES B. LEONE, M. D.

Dr. Charles B. Leone, a member of the staffs of the Wilmington General and St. Francis Hospitals, died on January 13, 1949, at the Pennsylvania Hospital, of a liver complaint, aged 64.

Born in Italy in 1884, Dr. Leone received his early education in Italian schools. He came to this country in 1901. He was graduated from the Niagara University in Buffalo, and then attended the Baltimore Medical College, where he received the degree of doctor of medicine in 1913. Shortly after his graduation he established an office in this city and continued as a general practitioner until he was taken ill. He served as city physician during the administration of the late Dr. William H. Speer as mayor, and was a member of the Selective Board of Examining Physicians during World War II.

Dr. Leone was a member of the New Castle County Medical Society, the Medical Society of Delaware, and the American Medical Association. He was also a member of Columbus Lodge, Sons of Columbus, of Siracusa Lodge, and of the Fraternal Order of Eagles, and was the first president of the Unital Club, an Italian club organized here.

Surviving Dr. Leone are four children: Miss Sarah, Leonard, Charles B., Jr., and Richard Leone, all of Wilmington, and a sister, Mrs. Peter Bifarelle of Buffalo. His wife, Mrs. Anna Leone, died eight years ago.

The funeral was held on January 15, 1949, with services in St. Anthony's Catholic Church. Interment was in Cathedral Cemetery.

JACOB S. KEYSER, M. D.

Dr. Jacob S. Keyser died at his home in Wilmington on January 1, 1949, of a heart attack, aged 62 years. He had been ill only a short time. A resident of Wilmington for 35 years, Dr. Keyser came here from Philadelphia. At the time of his death he was president of the medical board at Wilmington General Hospital and chief of obstetrics and gynecology there and also at St. Francis Hospital, as well as holding the chairmanship of the department of surgery in the latter hospital.

A graduate of the University of Pennsylvania Medical College in 1912, Dr. Keyser served his interneship at Mt. Sinai Hospital, Philadelphia, from 1912 to 1914.

From 1915 to 1917 Dr. Keyser was anesthesiologist at Delaware Hospital. He was chief of staff for Wilmington General for several years. He had served during both World Wars as medical advisor for the local draft board. He was a member of the New Castle County Medical Society, Medical Society of Delaware, and the American Medical Association. He was also a fellow of the American College of Surgeons.

Dr. Keyser was also prominent in Masonic circles, holding the thirty-second degree, and memberships in Lafayette Lodge, A. F. and A. M., the Delaware Consistory, and Lulu Temple of the Shrine.

His wife, Mrs. Sarah Topkis Keyser, survives, as do a son, Dr. Morton Keyser; a daughter, Miss Alice Lou Keyser, and several nieces and nephews, all of this city.

The services were held at the Chandler Funeral Home, Delaware Avenue and Jefferson Street, on January 3, 1949. Interment was in Beth Emeth Memorial Park.

BOOK REVIEWS

Health Education. By the Joint Committee on Health Problems in Education of the National Education Association and the American Medical Association. Cloth. Pp. 413. Price, $3.00. Chicago: American Medical Association, 1948.

This is a completely rewritten fourth edition of a standard textbook and guide for teacher education. Under the editorship of Charles C. Wilson, M. D., Professor of Education and Public Health at Yale University, and a revision committee composed of Thurman B. Rice, M. D., Professor of Public Health, Indiana University, Bernice Moss, Ed. D., Department of Health and Physical Education, University of Utah, and W. W. Bauer, M. D., director of health education for the American Medical Association, the contributed material of nearly one hundred outstanding leaders in health education has been organized into a comprehensive, readable and up-to-date volume.

Present-day problems with solutions proved effective by experience are discussed in the twenty chapters under such titles as Health Problems: Past, Present and Future; Solving School and Community Health Problems; Finding and Using Resources and Health Education in Action.

Although the book is closely indexed for ready reference, the clear, non-technical presentation of material makes "Health Education" excellent as a textbook or for supplementary reading. Modern typography and a liberal number of photographs and tables highlight the text.

The Diabetic's Handbook. How to Work with Your Doctor. Treatment by Diet and Insulin, By Anthony M. Sindoni, Jr., M. D., Chief of the Department of Metabolism, Philadelphia General and St. Joseph Hospitals; Chairman of the Advisory committee on Diabetes to the Director of the Department of Public Health, Philadelphia; Chief of the Diseases of Metabolism, St. Francis Hospital, Wilmington, Delaware.

With A Foreword by

Charles C. Wolferth, A. B., M. D. Professor of Medicine, School of Medicine, Administrator of the Robinette Foundation for Research in Cardiovascular Diseases, University of Pennsylvania; Director for Cardiology, Professional Service Division, Veterans Administration; Consultant Cardiologist to the Jewish Hospital. Pp. 194. Cloth. Price $3.00. New York: Ronard Press Company, 1948.

A new edition of this manual has recently come off the press and the author states that it has been written in the expectation that its exact and complete information will enable the diabetic to live a normal, useful and happy life through understanding his condition and cooperating with his physician.

The first 28 pages of the Handbook contains "Questions and Answers" which includes practically every important question the diabetic might ask to become properly and fully informed on what he should know concerning his part in the care of the disease.

The book is well written and contains a wealth of information presented in nontechnical terms giving the essentials of what the patient must know for an intelligent understanding of his condition to enable him to follow the course that is so necessary for the effective control of his disease.

The book is intensely practical and from the manner of the author's presentation it is undoubtedly the best Handbook on diabetes available today.

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